Space Technology Research Grants

Self-Repair and Damage Mitigation of Metallic Structures

Completed Technology Project (2012 - 2017)

Project Introduction

The ability for a large-scale structure to autonomously mend damage is critical in engineering systems that are difficult or impractical to repair in service. This research program seeks to develop lightweight metallic components with the capability to sense damage and self-repair. Integral parts of this program include the exploration of novel concepts such as in-situ self-fluxing, integrating high performance shape memory alloy reinforcement as a crack closure and toughening agent and passive fiber optic sensing. This technology has the potential to significantly reduce cost, space and weight, and with the value-added characteristic of the ability to heal from damage for increased reliability, structures can be designed with unprecedented and revolutionary capabilities.

Anticipated Benefits

This technology has the potential to significantly reduce cost, space and weight, and with the value-added characteristic of the ability to heal from damage for increased reliability, structures can be designed with unprecedented and revolutionary capabilities.

Primary U.S. Work Locations and Key Partners

Organizations Performing Work	Role	Type	Location
University of Florida	Lead Organization	Academia	Gainesville, Florida

Project Image Self-repair and Damage Mitigation of Metallic Structures

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Primary U.S. Work Locations
Florida

Images

11480-1363264476937.jpg
Project Image Self-repair and Damage Mitigation of Metallic Structures
(https://techport.nasa.gov/image/1820)

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
University of Florida

Responsible Program:
Space Technology Research Grants

Project Management

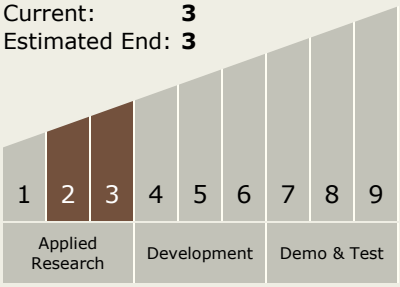
Program Director:
Claudia M Meyer

Program Manager:
Hung D Nguyen

Principal Investigator:
Michele V Manuel

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.1 Manufacturing Processes

Target Destinations

The Moon, Mars, Foundational Knowledge